

DEPARTMENT OF MICROBIOLOGY

COURSE FILE

NAME OF THE FACULTY	E. GURAVAI AH
DESIGNATION AND EMAIL	LECTURER
COURSE CODE	BS 104
COURSE TITLE	INTRODUCTORY MICROBIOLOGY
ACADEMIC YEAR / SEMESTER	2017 – 2018/ SEMESTER I
NUMBER OF INSTRUCTIONAL HOURS	80

Introduction to the course

Microbiology deals with study of living organisms that are tiny and invisible to naked eye. This paper deals about the detailed structure of microorganisms with respect to their anatomy, origin, theories put forth for the development of microbiology, various instruments and procedures employed in identifying and isolating microorganisms.

Vision

To be a center of excellence in value based holistic quality education carving research, innovation and entrepreneurial attitude that transforms students into globally competent society sensitized graduates.

Mission

- To create a student centric institute support with innovative student pedagogy
- To maximize the utilization of the state-of-the-art infrastructure for the overall development of individuals.
- To encourage independent thinking and application-oriented collaborative research in the areas of contemporary interest to contribute to the development of the region and the nation.
- To provide effective teaching & learning environment for training graduates with values, entrepreneurial attitude and globally employable skills.
- To encourage participation in games & sports, co-curricular and extra-curricular activities resulting in overall personality development.

PROGRAM OUTCOMES

SL NO	PROGRAM OUTCOMES
PROGRAM TITLE: BSc (BACHELOR OF SCIENCES)	<ol style="list-style-type: none">1. <u>Core competency</u>:- The students shall acquire core competency in the core subject and its allied subject areas.2. <u>Analytical ability</u>:- The students will be able to demonstrate the knowledge in understanding research and addressing practical problems.3. <u>Critical Thinking and Problem Solving</u>:- The students will be given fundamental concepts and their applications of scientific principles.4. <u>Digitally equipped</u>:- The students will acquire digital skills and integrates the fundamental concepts with modern tools.5. <u>Ethical and psychological strengthening</u>:- The students will also strengthen their ethical and moral values and shall be able to deal with psychological weaknesses.6. <u>Team Player</u>:- The students shall be provided with team-workmanship in order to serve efficiently institutions, industry and society.7. <u>Independent Learner</u>:- Apart from subject skills and generic skills, the students will be encouraged to gain knowledge and skills for further higher studies, competitive examinations and employment.8. <u>Effective Communication skills</u>:- The students will be provided with the necessary communication skills, mastering speaking, reading, listening and writing effectively and to contact the real world for a meaningful interaction.9. <u>Environment and Sustainability</u>:- The students shall understand the issues related to environment sustainability and development.10. <u>Effective citizenship</u>:- The students shall demonstrate empathetic social concern and equity centered national development and the ability to act with an informed awareness of issues and participate in civil life through volunteering.

PROGRAM SPECIFIC OUTCOMES

<p>Program Specific Outcomes – MICROBIOLOGY</p>	<p>Students majoring in Microbiology will develop a comprehensive understanding and appreciation in:</p> <ol style="list-style-type: none">1) Diversity and significance of microbes on planet earth including the principles of microbial physiology, biochemistry, and genetics2) Diversity of both prokaryotic and eukaryotic microbes, as well as their evolutionary relationships3) Impact of microorganisms on environment, plant, animal, and human hosts.4) Comprehensive knowledge on biological, chemical and physical sciences background to prepare them for advanced study in specialty microbiology courses.5) Literacy-access skills as well as the oral and written communication skills necessary to access and evaluate scientific information relevant to contemporary topics/issues
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COURSE OBJECTIVES AND MAPPING

ASSESSMENT LEVELS: 0 – NOT MAPPED; 1 –MAPPED AT WEAK LEVEL; 2 – MAPPED AT MODERATE LEVEL; 3 – MAPPED AT SATISFACTORY LEVEL

COURSE TITLE		COURSE CODE					COURSE OUTCOMES				
INTRODUCTORY MICROBIOLOGY		BS 104					On successful completion of this subject the students will gain: <ol style="list-style-type: none"> 1) Basic knowledge about microbiology starting from history 2) Basic knowledge about the micro organisms. 3) Knowledge of basic laboratory techniques in microbiology and their application 4) Methods of isolating and preserving microorganisms 				
	PO -1	PO -2	PO -3	PO -4	PO -5	PO -6	PO -7	PO -8	PO -9	PO -10	
CO -1	2	2	2	0	0	0	3	0	0	2	
CO -2	3	2	3	2	0	1	3	0	1	2	
CO -3	2	2	2	0	2	0	3	0	0	2	
CO -4	3	2	3	3	1	3	3	0	2	2	
TOTAL ATTIAINMENT	2.5	2.0	2.5	1.25	0.75	1.0	3.0	00	0.75	2.0	

$WPI = \sum_j (CO_j) / 4 \text{ (} i=1 \text{ to } 10 \text{ and } j=1 \text{ to } 4 \text{)}$ (WPI is the Weight factor for Programme Outcome PO1)
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CLASS TIME-TABLE

Department : MICROBIOLOGY

Class / Semester : MBZC – I SEMESTER I

Academic year : 2017 -2018

DAY / HOURS	1 (10.00AM-10.50AM)	2 (10.50AM-11.40 AM)	3 (11.40 AM-12.30 PM)		4 (01.30 PM-02.20 PM)	5 (02.20PM-03.10 PM)	6 (03.10 PM-04.00 PM)
MON	MB -I						MB –I TUT
TUE	MB -I						
WED	MB -I						
THURS	-----	MB –I LAB	-----		MB -I		
FRI							
SAT							

Subject Code	Subject	Name of the Faculty
BS 104	INTRODUCTORY MICROBIOLOGY	E. GURAVIAH

B. Sc (CBCS) Microbiology – I Year
Semester- I – Paper- I
BS104-DSC-1A: INTRODUCTORY MICROBIOLOGY

Theory syllabus

Credits – 4

UNIT – I

1. Meaning, definition and history of Microbiology. Contributions of Antony von Leeuwenhoek, Edward Jenner, Louis Pasteur, Robert Koch, Iwanowsky, Beijerinck, Winogradsky and Alexander Fleming.
2. The origin of microbial life - Spontaneous generation (abiogenesis), Biogenesis, Germ Theory of disease, Koch's Postulates.
3. Outline classification of living organisms: Heckel, Whittaker and Carl Woese systems. Place of microorganisms in the living world. Outline classification for bacteria as per the second edition of Bergey's Manual of Systematic Bacteriology (up to section level). Scope, importance and applications of Microbiology.

UNIT – II

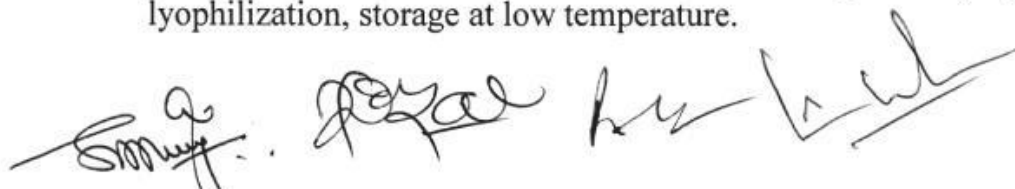
1. Principles of microscopy – bright field, dark field, phase-contrast, fluorescent and electron microscopy.
2. Differentiation of prokaryotes and eukaryotes.
3. Structure and function of Plasma membrane, cell wall, capsule, flagella, nucleod, plasmid, Gram positive and Gram negative bacteria

UNIT – III

1. Principles and types of stains - Simple and differential staining: theories of staining, mordant and its function, Gram staining, acid fast staining; endospore staining, negative staining, capsule staining, flagella staining.
2. Sterilization and disinfection techniques - Principles and methods of sterilization. Physical methods - autoclave, hot-air oven, pressure cooker, laminar air flow, filter sterilization.
3. Radiation methods - UV rays, gamma rays, ultrasonic methods. Chemical methods - Use of alcohols, aldehydes, fumigants, phenols, halogens and hypochlorites. Phenol coefficient.

UNIT - IV

1. Classification and characteristics of fungi, algae, protozoa and viruses.
2. Isolation of pure culture techniques - Enrichment culturing, pour plate, streak-plate, spread plate and micromanipulator.
3. Preservation of microbial cultures – sub culturing, overlaying cultures with mineral oils, lyophilization, storage at low temperature.



B. Sc (CBCS) Microbiology – I Year
Semester- I – Paper- I
BS104-DSC-1A: INTRODUCTORY MICROBIOLOGY

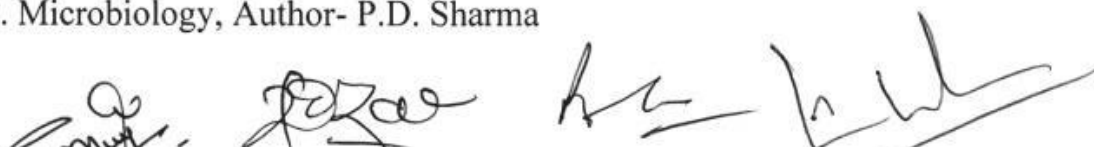
Practical syllabus

Credits – 1

1. Precautions to work in Microbiology laboratory.
2. Sterilization techniques: Autoclaving, hot-air oven and filtration.
3. Aseptic transfer of Microorganisms
4. Isolation of single colonies on solid media.
5. Light, compound microscope and its handling.
6. Microscopic observation of bacteria (Gram +ve bacilli and cocci, Gram –ve bacilli), cyanobacteria (*Nostoc*, *Spirulina*), algae (*Scenedesmus* sp., diatoms), and fungi (*Saccharomyces*, *Rhizopus*, *Aspergillus*, *Penicillium*, *Fusarium*).
7. Calibrations of microscopic measurements (Ocular, stage micrometers).
8. Demonstration of Motility by hanging drop method.
9. Micrometry: Determination of size of Bacteria, yeast. Fungal filaments.

References:

1. Tortora GJ, Funke BR and Case CL. (2008). Microbiology: An Introduction. 9th edition. Pearson Education.
2. Madigan MT, Martinko JM, Dunlap PV and Clark DP. (2014). Brock Biology of Microorganisms. 14th edition. Pearson International Edition.
3. Cappuccino J and Sherman N. (2010). Microbiology: A Laboratory Manual. 9th edition. Pearson Education Limited.
4. Wiley JM, Sherwood LM and Woolverton CJ. (2013) Prescott's Microbiology. 9th Edition. McGraw Hill International.
5. Atlas RM. (1997). Principles of Microbiology. 2nd edition. WM.T.BrownPublishers.
6. Pelczar MJ, Chan ECS and Krieg NR. (1993). Microbiology. 5th edition. McGrawHill Book Company.
7. Stanier RY, Ingraham JL, Wheelis ML, and Painter PR. (2005). General Microbiology. 5th edition. McMillan.
8. General Microbiology (1993) Authors- Powar and Daginawala.
9. Microbiology, Author- S.S. Purohit.
10. Microbiology, Author- P.D. Sharma



TEACHING PLAN

Department : MICROBIOLOGY

Name of faculty: E.

GURAVIAH

Semester / Year: MBZC SEMESTER 1

Paper title: INTRODUCTORY

MICROBIOLOGY

Sl No	Unit / Topic	Teaching Planned on Date	No of Periods Planned	Course Outcomes	Teaching aids used
1	HISTORY OF MICROBIOLOGY AND CONTRIBUTIONS OF SCIENTISTS; LEEUWEN HOEK, LOUIS PASTEUR, EDWARD JENNER, ROBERT KOCH, BEIJERINCK, IWANOWSKY, WINOGRADSKY AND ALEXANDER, FLEMING, SPONTANEOUS GENERATION VS BIOGENESIS, GERM THEORY; OUTLINES OF CLASSIFICATION SYSTEMS; HACKEL, WHITTAKER AND CARL WOESE SYSTEMS, BERGEYS MANUAL OF SYSTEMIC BACTERIOLOGY, SCOPE, IMPORTANCE AND APPLICATIONS OF MICROBIOLOGY	12/06/2017 TO 27/06/2017	14	PO -1,3, 7; CO -1,2	BLACK BOARD & CHALK,
2	PRINCIPLES OF MICROSCOPY; BRIGHT FIELD, DARK FIELD, PHASE CONTRAST, FLUORESCENT AND ELECTRON MICROSCOPY, STRUCTURE OF PROKARYOTIC CELL, DIFFERENCES BETWEEN PROKARYOTES AND EUKARYOTES	28/06/2017 TO 18/07/2017	18	PO -1, 3,7; CO -1,2	BLACK BOARD & CHALK, LIVE DEMO
3	STAINING – THEORIES, TYPES AND APPLICATIONS; PHYSICAL METHODS OF STERILIZATION; METHODS OF DISINFECTION AND RADIATION	19/07/2017 TO 12/08/2017	21	PO -1, 3,7; CO -1,2,3	BLACK BOARD & CHALK, LIVE DEMO
4	ISOLATION AND PURIFICATION OF PURE CULTURES; PRESERVATION OF PURE CULTURES; CLASSIFICATION AND GENERAL CHARACTERS OF ALGAE; CLASSIFICATION AND GENERAL CHARACTERS OF PROTOZOA; CLASSIFICATION AND GENERAL CHARACTERS OF FUNGI; CLASSIFICATION AND GENERAL CHARACTERS OF VIRUSES	16/08/2017 TO 18/09/2017	27	PO -1, 3,7; CO -1,2,3,4	BLACK BOARD & CHALK, LIVE DEMO

List of Recommended Text Books

SNO	Name of the Book	Author
1	TELUGU AKADEMI MICROBIOLOGY	S.RAM REDDY

List of Reference Text Books

SNO	Name of the Book	Author
1	MICROBIOLOGY	R.C DUBEY AND MAHESHWARI
2	MICROBIOLOGY	PELCZAR
2	MICROBIOLOGY	PRESSCOTT

List of URL's to be Referred

SNO	Name of the URL
01	https://microbiologyinfo.com/
02	https://www.asm.org/
03	https://microbiologyonline.org/

Methodology for Continuous Internal Evaluation

SNO	NAME OF THE EXAM	MAX MARKS
01	Internal examinations	20
02	Unit test	40
03	Pre final examinations	80

LESSON PLAN

SNO	Topic Name	Planned Date	No of hours	Book Referred	Teaching Methodology
1	HISTORY OF MICROBIOLOGY AND CONTRIBUTIONS OF SCIENTISTS; LEEUWEN HOEK, LOUIS PASTEUR, EDWARD JENNER, ROBERT KOCH, BEIJERINCK, IWANOWSKY, WINOGRADSKY AND ALEXANDER, FLEMING	12/06/2017	03	PRESCOTT	LECTURE
2	SPONTANEOUS GENERATION THEORY VERSUS BIOGENESIS THEORY, GERM THEORY OF DISEASE	15/06/2017	03	PRESCOTT	LECTURE
3	OUTLINES OF CLASSIFICATION SYSTEMS; HACKEL, WHITTAKER AND CARL WOESE SYSTEMS, BERGEYS MANUAL OF SYSTEMIC BACTERIOLOGY	19/06/2017	04	PRESCOTT, RC DUBEY AND MAHESHWARI	LECTURE
4	SCOPE, IMPORTANCE AND APPLICATIONS OF MICROBIOLOGY	23/06/2017	04	PRESCOTT, RC DUBEY AND MAHESHWARI	LECTURE
5	MICROSCOPY; BRIGHT FIELD, DARK FIELD, PHASE CONTRAST, FLUORESCENT AND ELECTRON MICROSCOPY	28/06/2017	08	PELCZAR	LECTURE
6	STRUCTURE OF PROKARYOTIC CELL, DIFFERENCES BETWEEN PROKARYOTES AND EUKARYOTES	07/07/2017	10	PRESCOTT	LECTURE
7	STAINING – THEORIES, MORDANT AND ITS FUNCTION, GRAM STAINING	19/07/2017	03	RC. DUBEY AND MAHESHWARI	LECTURE
8	ACID FAST STAINING, ENDOSPORE STAINING	22/07/2017	03	RC. DUBEY AND MAHESHWARI	LECTURE
9	CAPSULE STAINING, NEGATIVE STAINING, FLAGELLA STAINING,	26/07/2017	03	RC. DUBEY AND MAHESHWARI	LECTURE
10	PHYSICAL METHODS OF STERILIZATION: PRESSURE COOKER, AUTOCLAVE, HOT AIR OVEN, LAMINAR AIR FLOW	29/07/2017	07	ANANTHA NARAYANA AND PANIKER	LECTURE
11	FILTER STERILIZATION	08/08/2017	01	ANANTHA NARAYANA AND PANIKER	LECTURE
12	METHODS OF DISINFECTION, PHENOL COEFFICIENT	09/08/2017	03	ANANTHA NARAYANA AND PANIKER	LECTURE

13	RADIATION STERILIZATION	12/08/2017	01	ANANTHA NARAYANA AND PANIKER	LECTURE
14	ISOLATION AND PURIFICATION OF PURE CULTURES	16/08/2017	06	PRESCOTT	LECTURE
15	PRESERVATION OF PURE CULTURES	23/08/2017	02	PRESCOTT	LECTURE
16	CLASSIFICATION AND GENERAL CHARECTERS OF ALGAE	26/08/2017	04	PRESCOTT	LECTURE
17	CLASSIFICATION AND GENERAL CHARECTERS OF PROTOZOA	31/08/2017	05	PELCZAR	LECTURE
18	CLASSIFICATION AND GENERAL CHARECTERS OF FUNGI	07/09/2017	04	ALEXOPOLUS	LECTURE
19	CLASSIFICATION AND GENERAL CHARECTERS OF VIRUSES	12/09/2017	07	SM REDDY AND S RAM REDDY	LECTURE

RECORD OF TUTORIAL CLASSES CONDUCTED

SNO	DATE	NAME OF FACULTY	TUTORIAL TOPIC
1	06/10/2018	E. GURAVIAIH	CONTRIBUTIONS OF SCIENTISTS TO MICROBIOLOGY
2	07/10/2018	E. GURAVIAIH	MICROSCOPY
3	09/10/2018	E. GURAVIAIH	STERILIZATION TECHNIQUES
4	12/10/2018	E. GURAVIAIH	PURE CULTURES
5	13/10/2018	E. GURAVIAIH	GENERAL CHARECTERS OF ALGAE
6	14/10/2018	E. GURAVIAIH	GENERAL CHARECTERS OF PROTOZOA
7	20/10/2018	E. GURAVIAIH	GENERAL CHARECTERS OF FUNGI
8	21/10/2018	E. GURAVIAIH	GENERAL CHARECTERS OF VIRUSES

RECORD OF MAKEUP CLASSES CONDUCTED

Date: 26/07/2017
Academic Year: 2017 - 2018
Period: From: 3:30 PM To: 4:30 PM

Faculty Name: E. GURAVIAH
Reason: LESS SCORE IN FIRST INTERNAL
Total Duration: 1 HOUR

Students Details:

Sl No.	Roll No	Name of the Student
1	076183202	B. PRAVEENA
2	076183204	CH. VINOD KUMAR
3	076183207	G. SRIKANTH
4	076183208	G. ABHISHEK

Date: 23/08/2017
Academic Year: 2017 - 2018
Period: From: 3:30 PM To: 4:30 PM

Faculty Name: E. GURAVIAH
Reason: LESS SCORE IN FIRST MID TERM
Total Duration: 1 HOUR

Students Details:

Sl No.	Roll No	Name of the Student
1	076183201	A. SAI KUMAR
2	076183204	CH. VINOD KUMAR
3	076183213	P. SAI KUMAR
4	076183214	HASEENA

Date: 12/09/2017
Academic Year: 2017 - 2018
Period: From: 3:30 PM To: 4:30 PM

Faculty Name: E. GURAVIAH
Reason: LESS SCORE IN SECOND INTERNAL
Total Duration: 1 HOUR

Students Details:

Sl No.	Roll No	Name of the Student
1	076183201	A. SAI KUMAR
2	076183204	CH. VINOD KUMAR
3	076183207	G. SRIKANTH
4	076183208	G. ABHISHEK

RECORD OF STUDENT SEMINARS

ROLL. NO	NAME OF THE STUDENT	TOPIC
076183202	B. PRAVEENA	STAINING TECHNIQUES
076183205	D. ANJALI	ELECTRON MICROSCOPY
076183206	D. SUSHMITHA	GENERAL CHARACTERS OF VIRUSES
076183209	J. PADMA	METHODS OF DISINFECTION
076183212	M. TEJASHWINI	ULTRASTUCTURE OF PROKARYOTIC CELL
076183216	SK. KOWSER	PHYSICAL METHODS OF STERILIZATION
076183217	S. SOWJANYA	PURE CULTURES

Faculty of Sciences
Department of Microbiology
Internal Assessment –I
Semester – 1 Paper – 1: INTRODUCTORY MICROBIOLOGY

Time: 1 ½ hour
Marks: 20

NAME OF STUDENT: _____ HALLTICKET NO: _____

CLASS: _____ YEAR/SEMESTER : _____

SECTION – A (5 × 1 = 5)
Multiple choice questions

1. Which following scientist supported the “Biogenesis theory” by goose neck experiment? ()
a. Beijerinck b. Louis Pasteur c. Winogradsky d. Iwanowsky
2. What is the new taxonomical rank introduced by Carl Woese? ()
a. Sub species b. Genus c. Domain d. Family
3. Which following cell organelle in a bacterium is assumed to function as mitochondria? ()
a. Mesosome b. Peroxisome c. Ribosome d. Lysosome
4. Which statement is true about a plasmid? ()
a. Linear, single stranded, self replicating, chromosomal DNA
b. Circular, double stranded, self replicating, chromosomal DNA
c. Linear, single stranded, self replicating, extra chromosomal DNA
d. Circular, double stranded, self replicating, extra chromosomal DNA
5. Identify the stain used in fluorescent microscopy? ()
a. Comasive blue b. Auramine c. Congo red d. India Ink

SECTION – B (5 × 1 = 5)
Fill in the blanks

6. _____ is considered as “Father of Microbiology”.
7. Beijerinck termed viruses as _____
8. _____ and _____ are the subunits of ribosomes present in a bacteria
9. The chief cell wall component of Staphylococcus aureus is _____
10. _____ is region of LPS layer that resemble plasma membrane

SECTION – C (5 × 1 = 5)
Match the following

- | | | |
|-------------------------|-----|------------------------------|
| 11. Abbe condenser | () | a. Bacteria |
| 12. Pentaglucine bridge | () | b. Penicillin |
| 13. Alexander Fleming | () | c. Peptidoglycan |
| 14. Haeckel | () | d. Phase contrast microscope |
| 15. Monera | () | e. 3 kingdom classification |
| | | f. 3. Domain concept |
| | | g. Dark field microscope |

SECTION – D 5M
Assignment

16. Explain scope importance and application of microbiology?

Faculty of Sciences
Department of Microbiology
Internal Assessment –II
Semester – 1 Paper – 1: INTRODUCTORY MICROBIOLOGY

Time: 1 ½ hour
Marks: 20

NAME OF STUDENT: _____ HALLTICKET NO: _____

CLASS: _____ YEAR/SEMESTER : _____

SECTION – A (5 × 1 = 5)
Multiple choice questions

1. On what principle does autoclave works? ()
a. Filtration b. Moist heat c. Radiation d. Dry heat
2. Which following organisms give positive result for negative staining? ()
1) Klebshiella 2) E. coli 3) Staphylococcus 4) Cryptococcus
a. 1 and 2 b. 2 and 3 c. 3 and 4 d. 1 and 4
3. Which following disinfectant can be used for sterilization of shopping malls and theatres? ()
a. Ethylene dioxide b. Ethyl alcohol c. Detergent d. Formaldehyde
4. Statement: All viruses are obligate intracellular parasites ()
Reason: viruses contain either DNA or RNA as genetic material
a. Both statement and reason are true and reason is correct explanation of statement
b. Statement is true but reason is false
c. Both statement and reason are true and reason is not correct explanation of statement
d. Both statement and reason are false
5. Identify the stain used endospore staining? ()
a. Methylene blue b. Carbol fuschin c. Congo red d. Malachite green

SECTION – B (5 × 1 = 5)
Fill in the blanks

6. _____ filters are used in the construction of laminar air flow cabinets
7. Tobacco Mosaic Virus has _____ symmetry
8. Ameoba belongs to the class _____
9. The decolorizing agent used in acid fast staining is _____
10. _____ test is used for testing efficacy of a disinfectant

SECTION – C (5 × 1 = 5)
Match the following

- | | | |
|----------------------|-----|------------------------------|
| 11. Gram staining | () | a. Pure culture purification |
| 12. Gamma rays | () | b. Pure culture preservation |
| 13. Lysol | () | c. Filtration |
| 14. Micromanipulator | () | d. Disinfectant |
| 15. Lypphilization | () | e. Cold sterilization |
| | | f. Pure culture isolation |
| | | g. Ethanol |

SECTION – D 5M
Assignment

16. Write in detail about application of sterilization in daily life?

Faculty of Sciences
Department of Microbiology
Unit test –I
Semester – 1 Paper – 1: INTRODUCTORY MICROBIOLOGY

Time: 1 ½ hour
40

Marks:

SECTION – A (4 × 4 = 16)

ANSWER ANY FOUR OF THE FOLLOWING NOT EXCEEDING 50 LINES

1. Robert Koch
2. Spontaneous generation theory
3. Winogradsky
4. Louis Pasteur
5. Edward Jenner
6. Phase contrast Microscopy

SECTION – B (2 × 12 = 24)

ANSWER ANY TWO OF THE FOLLOWING NOT EXCEEDING 120 LINES

7. (a) Write in detail about structure of bacterial cell wall?
(or)
(b) Write in detail about principle, construction and working of Electron microscopy?
8. (a) Write in detail about history, scope and applications of microbiology?
(or)
(b) Discuss the criteria and characters of living organisms by Whittaker system of classification?

Faculty of Sciences
Department of Microbiology
Unit test –II
Semester – 1 Paper – 1: INTRODUCTORY MICROBIOLOGY

Time: 1 ½ hours
40

Marks:

SECTION – A (4 × 4 = 16)
ANSWER ANY FOUR OF THE FOLLOWING NOT EXCEEDING 50 LINES

1. Negative staining
2. Cold sterilization
3. Autoclave
4. General characters of fungi
5. Enrichment culture
6. General characters of algae

SECTION – B (2 × 12 = 24)
ANSWER ANY TWO OF THE FOLLOWING NOT EXCEEDING 120 LINES

7. (a) Write the principle and protocol for gram staining and its importance in microbiology?
(or)
(b) Write in detail about disinfection and add a note on phenol coefficient?
8. (a) Write an essay on isolation, purification and preservation of pure cultures?
(or)
(b) Discuss the structure, general characters and classification of viruses and add note on their role as pathogens?

Faculty of sciences
Department of Microbiology
Degree Pre-final examinations – 2018
Semester 1 - Paper – 1: Introductory Microbiology

Time: 3 hrs
Marks: 80

Section A (8×4=32)
Answer any eight not exceeding 50 lines

- | | |
|----------------------------------|-----------------------------------|
| 1. Louis Pasteur | 7. Negative staining |
| 2. Carl Woese system | 8. Capsular staining |
| 3. Spontaneous generation theory | 9. Filtration |
| 4. Dark field microscopy | 10. Phenol coefficient test |
| 5. Gram negative cell wall | 11. Preservation of pure cultures |
| 6. Nucleod | 12. Viruses |

Section B (4×12=48)
Answer all the questions not exceeding 120 lines

13. a. Write a detailed note on history scope and applications of microbiology?
(or)
b. Write in detail about Whittaker system of classification?
14. a. Write in detail about electron microscopy?
(or)
b. Write in detail about parts of a compound microscope with neat labeled diagram?
15. a. Discuss in detail about physical methods of sterilization?
(or)
b. Write in detail about chemical methods of sterilization?
16. a. Write a detailed account about isolation and purification of pure cultures?
(or)
b. Write in detail about classification of fungi?

STUDENT PROGRESSION AND MARKS STATEMENT

ROLL NO	NAME OF STUDENT	INTERNAL TEST -1	UNIT TEST - 1	INTERNAL TEST -2	UNIT TEST -2
076183201	A. SAI KUMAR	08	22	12	25
076183202	B. PRAVEENA	12	28	16	30
076183203	CH. NAGAI AH	07	20	10	24
076183204	CH. VINOD KUMAR	07	18	09	21
076183205	D. ANJALI	14	30	17	33
076183206	D. SUSHMITHA	14	29	18	35
076183207	G. SRIKANTH	08	19	10	21
076183208	G. ABHISHEK	11	20	14	26
076183209	J. PADMA	15	28	18	35
076183212	M.TEJASWINI	12	25	17	32
076183213	P. SAI KUMAR	09	18	12	23
076183214	SK. HASEENA	10	20	13	25
076183215	SK.IJAJ BABA	08	17	12	20
076183216	SK.KOWSER	13	24	16	27
076183217	S. SOWJANYA	13	23	16	27
076183218	V. SAI GANESH	07	15	09	18
076183219	P. VINOD KUMAR	09	12	13	22

TEACHING SYNOPSIS

Department : MICROBIOLOGY
Semester / Year: MBZC SEMESTER 1

Name of faculty: E. GURAVIAH
Paper title: INTRODUCTORY MICROBIOLOGY

Unit no	Topics	Synopsis	Hours allotted	Hours taught	Extra hours taken	Reason
1	HISTORY OF MICROBIOLOGY AND CONTRIBUTIONS OF SCIENTISTS; SPONTANEOUS GENERATION VS BIOGENESIS, GERM THEORY; OUTLINES OF CLASSIFICATION SYSTEMS, SCOPE, IMPORTANCE AND APPLICATIONS	MICROBIOLOGY HAS EVOLVED IN LATE 1600's WITH THE INVENTION OF FIRST MICROSCOPE BY ZACHARIS ZANSEN. ALTHOUGH, ANTONY VON LEUWEENHOEK CONTRIBUTIONS AND DISCOVERY OF MICROSCOPE HAD MADE A REVOLUTIONARY TRENDS IN EMERGING OF THIS BRANCH OF BIOLOGY. VARIOUS SCIENTISTS LIKE EDWARD JENNER, LOUIS PASTEUR, IWANOSKY, ALEXANDER FLEMING, BEIJERICK, ETC HAVE ALSO PUT THEIR EFFORTS SUCH THAT MICROBIOLOGY NOW STANDS AS A MAJOR BRANCH OF BIOLOGY. EARLIER, LIFE WAS THOUGHT TO BE EMERGED FROM NON LIVING OBJECTS (SPONTANEOUS GENERATION THEORY), AS DEPICITED IN GREEK MYTHOLOGY, BUT LATER, SCIENTISTS LIKE JOHN NEEDHAM, LOUIS PASTEUR DISPROVED IT AND PROPOSED A NEW THEORY NAMED BIOGENESIS THEORY. NOW MICROBIOLOGY HAS VARRIOUS SCOPE AND APPLICATIONS IN THE FIELD OF AGRICULTURE, MEDICINE, VETERNARY, ENVIROMENTAL, INDUSTRIAL, PHARMACEUTICAL, ETC	14	16	02	AS CONCEPTS OF MICROBIOLOGY ARE NEW FOR ANY UNDER GRADUATE STUDENT, THE FLOW OF LEARNING IS A SLOW PROCESS
2	MICROSCOPY; STRUCTURE OF PROKARYOTIC CELL, DIFFERNCES BETWEEN PROKARYOTES AND EUKARYOTES	MICROSCOPY IS ONE OF THE BASIC TECHNIQUES IN MICROBIOLOGY FOR VISULIZATION OF MICROORGANISMS. AS NAME SUGGESTS, MICROBES ARE AS TINY AS TO BE SEEN BY A NAKED EYE, MICROSCOPE AIDS A LOT FOR THE STUDY OF MICROBIAL ANATOMY. MICROSCOPY IS BASICALLY OF TWO TYPES,	18	20	02	AS CONCEPTS OF MICROBIOLOGY ARE NEW FOR ANY UNDER GRADUATE STUDENT, THE FLOW OF

		<p>CATEGORIZED BASED ON THE ILLUMINATING SOURCE, NAMELY LIGHT MICROSCOPES AND ELECTRON MICROSCOPES. LIGHT MICROSCOPES USE VISIBLE LIGHT (EX: DARK FIELD, BRIGHT FIELD, PHASE CONTRAST AND FLOROSCENT MICROSCOPES) AND ELECTRON MICROSCOPES (TRANSMISSION AND SCANNING) USED BEAM OF ELECTRONS PRODUCED FROM ELECTRON GUN FITTED WITH TUNGSTEN FILAMENT.</p> <p>AS MICROBES ARE LIVING CELLS, THEY CAN EXSIST IN BOTH PROKARYOTIC AND EUKARYOTIC FORMS. THE BASIC DIFFERENCE BETWEEN AN EUKARYOTE (ALGAE, PROTOZOA AND FUNGI) FROM A PROKARYOTE (BACTERIA) IS PRESENCE OF MEMBRANE BOUND CELL ORGANELLES (NUCLEUS, MITOCHONDRION, PLASTIDS, GOLGI APPERATUS AND ENDOPLASMIC RETICULUM). ALONG WITH THESE, THEY ALSO DIFFER IN SEVERAL OTHER ORGANELLES LIKE RIBOSOMES, CELLWALL, GENOME ORGANISATION, PLASMIDS, MICROFILAMENTS AND TUBLULES, FLAGELLA, ETC</p>				LEARNING IS A SLOW PROCESS
3	<p>STAINING – THEORIES, TYPES AND APPLICATIONS; PHYSICAL METHODS OF STERILIZATION; METHODS OF DISINFECTION AND RADIATION</p>	<p>STANING AND STERILIZATION ARE NEXT PRIOR TECHNIQUES IN MICROBIOLOGY. AS SEVERAL MICROORGANISMS ARE COLOURLESS, A MICROBIOLOGIST UTILIZES STANING METHODS FOR VISUALIZATION. THEY BASCIALLY INCLUDE USE OF A SINGLE STAIN (SIMPLE), MORE THAN ONE STAIN (DIFFENTIAL) AND METHODS FOR VISUALIZING SPECIALIZED ORGANELLES (STRUCUTRAL). STERILIZATION PLAYS A MAJOR ROLE IN ELIMINATION OF UNWANTED MICROORGANISMS INCLUDING SPORES. THE COMMON MODES OF STERILIZATION USED IN A ROUTINE MICROBIOLOGY LAB ARE PHYSICAL (HOT AIR OVEN, AUTOCLAVE, ETC), CHEMICAL (ALDEHYDES, ALCOHOLS, DETERGENTS, PHENOLS, ETC), RADIATIONS (X-RAYS, UV RAYS, ETC) AND FILTERATION (DEPTH, CHAMBER LAND, MEMBRANE, ETC). EACH</p> <p>METHOD HAS RESPECTIVE MODE OF ACTION AND CHEMICAL STERILIZATION, ALSO CALLED AS DISINFECTION CAN BE TESTED WITH STANDARD DISINFECTANT PHENOL, POPULAR AS PHENOL COEFFICENT TEST</p>	21	24	03	AS CONCEPTS OF MICROBIOLOGY ARE NEW FOR ANY UNDER GRADUATE STUDENT, THE FLOW OF LEARNING IS A SLOW PROCESS

4	ISOLATION AND PURIFICATION OF PURE CULTURES; PRESERVATION OF PURE CULTURES; CLASSIFICATION AND GENERAL CHARECTERS OF ALGAE; CLASSIFICATION AND GENERAL CHARECTERS OF PROTOZOA; CLASSIFICATION AND GENERAL CHARECTERS OF FUNGI; CLASSIFICATION AND GENERAL CHARECTERS OF VIRUSES	<p>A PURE CULTURE CAN BE ANY ENVIRONMENT THAT CONTAINS A SINGLE SPECIES OF MICROORGANISMS. OBTAINING A PURE CULTURE OF ANY ORGANISM INCLUDES 3 MAJOR STEPS NAMELY ISOLATION (SERIAL DILUTION AND POUR PLATE METHODS), PURIFICATION (SPREAD AND STRAK PLATE METHODS) AND PRESERVATION (SUBCULTURING, MINERAL OIL OVERLAYING, CRYOPRESERVATION, LYOPHILIZATION). THERE ARE SEVERAL OTHER PURIFICATION METHODS LIKE MICROMANIPULATOR, ENRICHMENT CULTURING, ETC. AS A CULTURE CAN BE IN BOTH SOLID AND LIQUID FORMS, ISOLATION, PURIFICATION AND PRESERVATION METHODS FOR BOTH TYPES VARRY.</p> <p>EARLIER, ALGAE AND FUNGI WERE TREATED AS PLANTS. THOUGH CAN BE SEEN BY A NAKED EYE, THE OBSERVATION OF ANATOMICAL STRUCUTRES LIKE SPORANGIUM, THALLUS, MYCELIUM, FLAGELLA, ETC NEEDED THE AID OF MICROSCOPE WHICH MADE THEM TO BE INCLUDED UNDER MICROBIOLOGY. PROTOZOANS, THOUGH STUDIED AS INVERTEBRATES UNDER ZOOLOGY, DUE TO UNICELLULAR MICROSCOPIC NATURE THEY WERE ALSO INCLUDED UNDER MICR BIOLOGY. MOST OF THESE GROUPS ARE FOUND AS TERRESTRIAL, MARINE, FRESH WATER. THEY EXHIBIT SYMBIOTIC, COMMENSALISTIC, PARASITIC RELATIONS WITH OTHER LIVING BEINGS. VIRUSES MAKE MOST FACINATING AND DISTINCTIVE AMONG OTHER MICROBES. THEY ARE STRUCUTRALLY SIMPLE (A PROTEIN COAT AND GENETIC MATERIAL) WITH COMPLICATED LIFE CYCLE PATTERNS. THEY SURVIVE AS LIVING BEINGS ONLY INSIDE A LIVING CELL. AS NAME SUGGESTS, VIRUSES ARE ALWAYS PATHOGENS AND CAN AFFECT ANY KIND OF LIVING CELL.</p>	27	28	01	AS CONCEPTS OF MICROBIOLOGY ARE NEW FOR ANY UNDER GRADUATE STUDENT, THE FLOW OF LEARNING IS A SLOW PROCESS
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